Comments for Draft Revisions *(Not Applicable to Directives; Refer to Directive Management Officer for Directive Comment Format)*

For detailed instructions on how to fill out the columns below, please see the Instructions sheet.

Comments Submitted By:	Vonnie Tong
Organization:	ANM-130L
Phone:	562-627-5333

#	Document Name	Page Number	Paragraph Number	Referenced Text	Comment/Rationale or Question	Proposed Resolution	Comment Type (Conceptual, Editorial, or Format)	Disposition/Response to Comment
1	AC 00-XX, Selection of Cyclic Redundancy Code and Checksum Algorithms to Ensure Critical Data Integrity	1 and 2	4	4a. FAA Advisory Circulars, and 4b. Industry Documents	Aeronautical database needs to be included for CRC and/or checksum calculation	Need to add AC 20-153A for aeronautical database and RTCA/DO-200A in 4a and 4b repectively	references	Accepted

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2	AC 00-XX, Selection of Cyclic Redundancy Code and Checksum Algorithms to Ensure Critical Data Integrity	3	3	6. Background, first paragraph, second sentence.	6. Background. Second sentence, “However, airborne systems that have undetected data errors …results of bit flips due to signal noise, electromagnetic interference…” From the report, it also mentions frame shifting error, shouldn't we also add "bits shift" error due to digital data frame shifts during data transmission.	Add bit shifts to the 2nd sentence as following: “However, airborne systems that have undetected data errors …results of bit flips, or bit shifts due to signal noise, electromagnetic interference…”	conceptural	Accepted
3	AC 00-XX, Selection of Cyclic Redundancy Code and Checksum Algorithms to Ensure Critical Data Integrity	3	3	6. Background, 2nd paragraph, second sentence.	6. Background. 2nd paragraph, 2nd sentence, “The problem that confronts…there is very little information… to use in determining the effectiveness of a specific CRC…" There are probably information out there for different types of CRC & checksum for the designer to be considered, but just one would provide the robust error detection for their application.	Suggest for editorial purposes, "The problem that confronts…there is minimal information available… to use implement a specific CRC…"	editorial	Not accepted. As an informational AC, it is not intended to a identify CRC to be used in a specific situation.

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Comments Submitted By:	Robert Jones and Ken Frey
Organization:	ANM-112
Phone:	x1234 /x2679

#	Document Name	Page Number	Paragraph Number	Referenced Text	Comment/Rationale or Question	Proposed Resolution	Comment Type (Conceptual, Editorial, or Format)	Disposition/Response to Comment
4	AC 00-xx	3	7	The FAA is highlighting this research report strictly as reference material that may be helpful to designers of airborne systems that use digital technology. It is not intended as guidance material or policy.	The last line of the ref text states it is not intended as a guidance material or policy. Is it appropriate to release an AC that applicants and ACOs are not supposed to use as guidance or policy?	Send copy of document to all DAH et al with text of the AC perhaps not release an AC. Perhaps include as an appendix in DO 178 or other appropriate industry document.	Conceptual	Not accepted. O1320.46D Chapter 3, 1.a.provides reasons for writing an AC. This includes to "(5) Help the industry and the FAA effectively implement a regulation." and and to "(7) Expand on standards needed to promote aviation safety…" The topic areas for a 00-series is General including definitions and abbreviations which we believe encompasses best practices. Also, as noted, the AC specifically says that it is not guidance.
5	AC 00-xx	3	6	Designers of these airborne systems may want to assess how the loss of integrity of safety-related digital data can occur, and include that assessment in the appropriate SSAs.	It should not be an option for designers to assess how loss of integrity of safety-related digital data can occur.	Change the sentence to read, "Designers of these airborne systems should assess how the loss of integrity of safety-related digital data can occur, and include that assessment in the appropriate SSAs."	Conceptual	Accepted.
6	AC 00-xx	3	6	Depending on the situation, the system designers will likely need to provide mechanisms for detection of the loss of integrity of safety-related digital data.	Detection should be provided for the loss of integrity of safety related digital data that is part of a critical safety system.	Change the sentence to read, "Designers should provide a means of detection for loss of integrity of digital data that is used by systems that have catastrophic failure conditions."	Conceptual	Not accepted. The proposed change addresses a specific failure condition (i.e., catastrophic). As an informational AC, it is not intended to identify CRCs used in specific situations or to address specific failure conditions.

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Comments Submitted By:	FAA Small Airplane Directorate, Avionics/Software (James Brady/Robin Sova)
Organization:	ACE-111/114 (Brady/Sova)
Phone:	816-329-4132/4133 (Brady/Sova)

#	Document Name	Page Number	Paragraph Number	Referenced Text	Comment/Rationale or Question	Proposed Resolution	Comment Type (Conceptual, Editorial, or Format)	Disposition/Response to Comment
7	Selection of Cyclic Redundancy Code and Checksum Algorithms to Ensure Critical Data Integrity	General	General	General	Per Order 1320.46D, it is not clear why this AC is being used as a Notice of Availability for a research report, especially since its "Purpose" paragraph states it is "…provided for information only and…is not intended as guidance…"	Do not issue this information in the form of an AC or else it may inadvertently be considered as official guidance and as a method of compliance to a regulation.	Editorial	Not accepted. O1320.46D Chapter 3, 1.a.provides reasons for writing an AC. This includes to "(5) Help the industry and the FAA effectively implement a regulation." and and to "(7) Expand on standards needed to promote aviation safety…" The topic areas for a 00-series is General including definitions and abbreviations which we believe encompasses best practices. Also, as noted, the AC specifically says that it is not guidance.
8	Selection of Cyclic Redundancy Code and Checksum Algorithms to Ensure Critical Data Integrity	1	Subject	The title "Selection of Cyclic Redundancy Code and Checksum Algorithms..."	The technique named CRC was originally defined as a method for checking the integrity of digital data, not to refer to the code used to implement its algorithms. Therefore, the correct original term for defining this method is "Cyclic Redundancy Check."	For correctness, change the Subject line from "Selection of Cyclic Redundancy Code and Checksum Algorithms..." to "Selection of Cyclic Redundancy Check and Checksum Algorithms..." (the word Algorithm therefore applies to both of these techniques).	Editorial	Not accepted. The title of the published research reoport is "Selection of Cyclic Redundancy Code and Checksum Algorithms to Ensure Critical Data Integrity". The Subject line is taken from the report title.

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9	Selection of Cyclic Redundancy Code and Checksum Algorithms to Ensure Critical Data Integrity	1	Purpose	The referenced title of the research report "Selection of Cyclic Redundancy Code and Checksum Algorithms…"	Am submitting this comment only to explain why it is not being recommended that the title be changed, as is being done in other closely related comments.	No report title change is proposed since it is merely referencing a previously published and so named research report.	Editorial	No action taken as no change is proposed.
10	Selection of Cyclic Redundancy Code and Checksum Algorithms to Ensure Critical Data Integrity	2	4.b.(2)	Industry Documents' list title for "RTCA DO-178B"	The title of this previous version of the DO included a "/" between "RTCA" and "DO"	For correctness, change the title listing of "RTCA DO-178B" to "RTCA/DO-178B"	Editorial	Not accepted. RTCA document number conventions have changed over time. Some (the more recent) use "RTCA DO-NNN" where NNN represents the individual document number, e.g., RTCA DO-178C. Others use "RTCA/DO-NNN". For consistency in this AC, all documents listed in section 4.b, are in the more recent form "RTCA DO-NNN". However, in section 4.a of this AC, the titles of the ACs listed use the title of the AC itself which, for those listed, happen to include "RTCA/DO-NNN".
11	Selection of Cyclic Redundancy Code and Checksum Algorithms to Ensure Critical Data Integrity	2	4.b.(5)	Industry Documents' list title for "RTCA/DO-254"	Except for this DO document, all the others in this section include a release date.	For consistency, change the end of the title listing from "...Hardware." to "...Hardware, dated April 19, 2000."	Editorial	Accepted.
12	Selection of Cyclic Redundancy Code and Checksum Algorithms to Ensure Critical Data Integrity	2	4.b.(5)	Industry Documents' title for "RTCA/DO-254"	Except for this DO document, all the others in this section appear to be listed in their numeric order.	For consistency, move item 4.b.(5) to a new position after the existing 4.b.(3) and before the existing 4.b.(4).	Editorial	Accepted.

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13	Selection of Cyclic Redundancy Code and Checksum Algorithms to Ensure Critical Data Integrity	3	6	The definition of the "(CRC)" acronym as "cyclic redundancy codes"	The technique named CRC was originally defined as a method for checking the integrity of digital data, not to refer to the code used to implement its algorithms. Therefore, the correct original term for defining this method's acronym is "cyclic redundancy check."	For correctness, change the defining phrase from "…are cyclic redundancy codes (CRC) and checksums." to "…are implemented as cyclic redundancy check (CRC) codes and checksums."	Editorial	Not accepted. The published research report defines the acronym CRC as cyclic redundancy code. The report also defines cyclic redundancy check as being a common equivalent term to cyclic reduncancy code. This AC will retain the terminology and acronyms as used in the report.

Comments for Draft Revisions *(Not Applicable to Directives; Refer to Directive Management Officer for Directive Comment Format)*

For detailed instructions on how to fill out the columns below, please see the Instructions sheet.

Comments Submitted By:	
Organization:	AIR-500
Phone:	(202) 267-8590

#	Document Name	Page Number	Paragraph Number	Referenced Text	Comment/Rationale or Question	Proposed Resolution	Comment Type (Conceptual, Editorial, or Format)	Disposition/Response to Comment
14	AC 00-XX, Selection of Cyclic Redundancy Code and Checksum Algorithms to Ensure Critical Data Integrity	Page 1, Header			The Date and AC No: sections are incomplete in the header and in Paragraph 3.	When this AC is signed, fill in the signature or effective date at the "Date:" section and also in Paragraph 3. Effective Date. Also, is "00-XX" the final and official name of this AC? If not, please update accordingly.	Awaiting completion and signature of AC	No action taken. The dates and final number of the AC will be entered upon signature. Neither are known as of this draft.
15	AC 00-XX, Selection of Cyclic Redundancy Code and Checksum Algorithms to Ensure Critical Data Integrity	Page 1, Paragraph 1			The second sentence in Paragraph 1 begins with the following: The information is in the form of a research report entitled Selection of Cyclic Redundancy Code…." This sentence could be clearer.	To clarify the reference to "The information…," consider striking "The" and replacing it with "This" for: "This information…" or "This AC…" or "**The information in this AC**…" Also, "…is in the form of a research report" is a bit awkward. Consider replacing with "…is derived from." for the following: The information in this AC is ~~in the form of~~ derived from a research report entitled "Selection of Cyclic Redundancy Code…."	Ease of reading	Partially accepted. "The information" was changed to "This information". Since this information is not "derived from" but is the report itself as a whole, the second proposed change was not made.

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16	AC 00-XX, Selection of Cyclic Redundancy Code and Checksum Algorithms to Ensure Critical Data Integrity	Page 1, Paragraph 1			The comma in the 4th line after "…Critical Data Integrity", should be inside the quotation marks.	Please move the comma to inside the quotation marks, as follows: "…Critical Data Integrity," DOT/FAA/…"	Grammar	Accepted.
17	AC 00-XX, Selection of Cyclic Redundancy Code and Checksum Algorithms to Ensure Critical Data Integrity	Page 1, Paragraph 4. a. (2) and (3)			The listing of the two ACs in (2) and (3) is out of numeric order	Consider switching (2) with (3) so that AC 20-170 follows after AC 20-152 in this listing	Proper ordering of the text	Accepted.
18	AC 00-XX, Selection of Cyclic Redundancy Code and Checksum Algorithms to Ensure Critical Data Integrity	Page 2, Paragraph 4. a. (11) and (12)			The CFR symbol sign (§) is used in (11) for 14 CFR §33.28 but not in (12) for the very same reference.	Unless you intend to use the section symbol for just the first reference to a CFR section, then please use uniform formatting for (11), (12), and (13) by striking the section symbol.	Consistent formatting	Accepted. The symbol § was added to reflect the actual titles of the ACs. In addition, AC 33.28-3 was added.

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19	AC 00-XX, Selection of Cyclic Redundancy Code and Checksum Algorithms to Ensure Critical Data Integrity	Page 2, Paragraph 4.b.(5)			A forward slash is used between “RTCA” and “DO” in (5) but not in the other similar citations.	As per the Web, both ways of citing “RTCA/DO” and RTCA DO” are common, so pick the preferred FAA formatting and use it consistently in (2) through (9). It seems that the forward slash should be removed from (5) and replaced with a space.	Consistent formatting	Not accepted. RTCA document number conventions have changed over time. Some (the more recent) use "RTCA DO-NNN" where NNN represents the individual document number, e.g., RTCA DO-178C. Others use "RTCA/DO-NNN". For consistency in this AC, all documents listed in section 4.b, are in the more recent form "RTCA DO-NNN". However, in section 4.a of this AC, the titles of the ACs listed use the title of the AC itself which, for those listed, happen to include "RTCA/DO-NNN".
20	AC 00-XX, Selection of Cyclic Redundancy Code and Checksum Algorithms to Ensure Critical Data Integrity	Page 2, Paragraph 4.b.(5)			The citation in (5) does not have a date listed with it, while all the other RTCA DO citations do have a date.	Unless this omission is intentional, please add the appropriate date to (5).	Consistent formatting	Accepted.
21	AC 00-XX, Selection of Cyclic Redundancy Code and Checksum Algorithms to Ensure Critical Data Integrity	Page 2, Paragraph 4.b.(4) and (5)			The DO items listed in (4) and (5) are out of sequence, with -297 coming before -254.	Consider switching items (4) and (5) so that the items will appear in their numeric order.	Proper ordering of the text	Accepted.

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22	AC 00-XX, Selection of Cyclic Redundancy Code and Checksum Algorithms to Ensure Critical Data Integrity	Page 3, Paragraph 5 Definition			"Integrity" is the only term defined in this AC. Are there other terms that should be defined?	Should other terms, such as "cyclic redundancy codes" or "checksums" also be listed and defined in Paragraph 5?	Ease of reading	No action taken. The term "integrity" was the only term identified that needed to be defined in this AC. While it is used many times in the report, it is not defined there. The other terms are defined in the report.
23	AC 00-XX, Selection of Cyclic Redundancy Code and Checksum Algorithms to Ensure Critical Data Integrity	Page 3, Paragraph 6			In the 2nd sentence of Paragraph 6, the use of the word "which" creates some lack of clarity in the text However, airborne systems that have undetected data errors which are the result of bit flips due to signal noise, electromagnetic interference, single event effects, or some other anomaly, could have serious operational safety consequences."	Please consider striking "which" and replacing it with "that" or "resulting from." If "resulting from" accurately captures the meaning, then that is the best choice, as shown below: "…However, airborne systems that have undetected data errors ~~which are the result of~~resulting from bit flips due to signal noise, electromagnetic interference, single event effects, or some other anomaly, could have serious operational safety consequences. '	Clarity of the text	Accepted.
24	AC 00-XX, Selection of Cyclic Redundancy Code and Checksum Algorithms to Ensure Critical Data Integrity	Page 4, Paragraph 8			The following instructions could be clearer to indicate that you are looking for feedback only on this AC: "If you have any suggestions for improvements or changes, you may use the template provided at the end of this AC."	Consider changing this sentence to the following: "If you have any suggestions for improvements or changes to this AC, you may use the template provided ~~at the end~~in Appendix A of this AC."	Clarity of text	Accepted.

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25	AC 00-XX, Selection of Cyclic Redundancy Code and Checksum Algorithms to Ensure Critical Data Integrity	Page A-1, Appendix A, Paragraph 1			The word “it” is missing from the first sentence of Appendix A.	Insert the word “it” as follows: “If you have comments or recommendations for improving this advisory circular (AC), or suggestions for new items or subjects to be added, or if you find an error, you may let us know about it by using this page as a template…”	Ease of reading	Accepted.